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INTERNATIONAL PRELIMINARY EXAMINATION REPORT  
(PCT Article 36 and Rule 70)

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|---|--|--|--|
| Applicant's or agent's file reference<br>PWO-0825   |  | <b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416) |  |
| International application No.<br>PCT/CA 02/01843  | International filing date (day/month/year)<br>27.11.2002 | Priority date (day/month/year)<br>27.11.2002   |  |
| International Patent Classification (IPC) or both national classification and IPC<br>H04L27/233 |  |  |  |
| Applicant<br>RESEARCH IN MOTION LIMITED et al   |  |  |  |

|   |  |
|---|--|
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p>  |  |
| <p>3. This report contains indications relating to the following items:</p> <p>I <input checked="" type="checkbox"/> Basis of the opinion</p> <p>II <input type="checkbox"/> Priority</p> <p>III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p>IV <input type="checkbox"/> Lack of unity of invention</p> <p>V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p>VI <input type="checkbox"/> Certain documents cited</p> <p>VII <input type="checkbox"/> Certain defects in the international application</p> <p>VIII <input type="checkbox"/> Certain observations on the international application</p> |  |

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|---|---|
| Date of submission of the demand<br><br>01.12.2003  | Date of completion of this report<br><br>17.02.2005                       |
| Name and mailing address of the international preliminary examining authority:<br><br> <p>European Patent Office<br/>D-80298 Munich<br/>Tel. +49 89 2399 - 0 Tx: 523656 epmu d<br/>Fax: +49 89 2399 - 4465</p> | Authorized Officer<br><br>Stolte, N<br><br>Telephone No. +49 89 2399-7989 |



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. **PCT/CA 02/01843**

**I. Basis of the report**

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

**Description, Pages**

1, 3-10 as originally filed  
2, 2a received on 19.10.2004 with letter of 19.10.2004

**Claims, Numbers**

1-28 received on 19.10.2004 with letter of 19.10.2004

**Drawings, Sheets**

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).  
☐ the language of publication of the international application (under Rule 48.3(b)).  
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority in written form.  
☐ furnished subsequently to this Authority in computer readable form.  
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.  
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY  
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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

|                               |             |      |
|-------------------------------|-------------|------|
| Novelty (N)                   | Yes: Claims | 1-28 |
|                               | No: Claims  |      |
| Inventive step (IS)           | Yes: Claims | 1-28 |
|                               | No: Claims  |      |
| Industrial applicability (IA) | Yes: Claims | 1-28 |
|                               | No: Claims  |      |

2. Citations and explanations

**see separate sheet**

**Re. item V**

**REMARKS WITH RESPECT TO ARTICLE 34 PCT**

1. The amendments filed with the letter dated 19.10.2004 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:
  - a. Present claims 1 and 15 refer to "a discrete Markov process". In the originally filed application however, only a first order Markov process is mentioned (see page 7, lines 3 and original claims 15, 30, 47). The original filed application provides no basis for such a generalization.
  - b. In contrast to the wording on original page 2 "using quasi-coherent integration", on new page 2a it says "using coherent integration". It is not apparent, whether there is any basis for such a generalization, in particular since the purpose of the invention is the estimation of a phase trajectory of the down converted signal. As a result, a coherent integration cannot be carried out (compare also original page 2, lines 19-28).
  - c. In contrast to the wording on original page 2 "for a measurement epoch of arbitrary duration", on new page 2a it says "for a small time epoch". It is not apparent, whether there is any basis for such an amendment.
2. The Report is established as if the amendment objected in 1a was not made, i.e. as if claims 1 and 15 referred to a first order Markov process (Rule 70.2(c) PCT)

**ANALYSIS WITH RESPECT TO ARTICLE 33 PCT**

3. Reference is made to the following documents:
  - D1: US-B1-6 477 208 (HUFF RONALD J) 5 November 2002 (2002-11-05)
  - D2: MUTSUMU SERIZAWA ET AL: "PHASE-TRACKING VITERBI DEMODULATOR" ELECTRONICS & COMMUNICATIONS IN JAPAN, PART I - COMMUNICATIONS, SCRIPTA TECHNICA. NEW YORK, US, vol. 79, no. 1, 1996, pages 82-96, XP000553793 ISSN: 8756-6621
  - D3: US-A-5 872 801 (MOBIN MOHAMMAD SHAFIUL) 16 February 1999 (1999-02-16)

4. The present application relates to a method/device for demodulation of a received spread-spectrum signal in the presence of varying phase of the channel and eg. the down converting oscillator.

5. CLOSEST PRIOR ART

Document D1 is considered to represent the closest prior-art. In D1 a demodulator is disclosed which is based on the Viterbi algorithm. The trellis used for demodulation takes possible phase transitions of the down converted signal due to phase instabilities of the up converter at the transmitter and the down converter at the receiver into account.

6. DISADVANTAGE

D1 does not teach a specific phase transition model to be used for calculation of the Viterbi metric.

7. PROBLEM AND SOLUTION OF THE APPLICATION

The problem solved by the present application may therefore be regarded as *how to improve the metric*.

The solution according to claims 1 and 15 consists in using a first order Markov model for calculation of the Viterbi metric.

8. FURTHER CITED DOCUMENTS

D2 discloses an apparatus/method similar to the one disclosed in D1. D3 discloses to use a short trace back in the Viterbi decoding process to improve channel estimation. None of the documents D1-D3 discloses to use a first order Markov process for approximation of the random process of the phase.

9. CONCLUSION

The subject-matter of independent claims 1 and 15 is therefore considered to be new and to involve an inventive step, Article 33(2) and (3) PCT.

10. The dependent claims describe specific embodiments of the method/apparatus as defined in the independent claims and therefore these dependent claims also fulfil the requirements of Article 33(2) and (3) PCT with respect to novelty and inventive step.